

Jetstream-31 (J31) Flight Report for INTEx-ITCT Flight 15 - 26 July 2004

Profiles and near-surface legs with Ron Brown and its sonde. Water vapor retrievals through cirrus and other thin clouds.

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Overview

This was the ninth J31 flight out of Pease. Goals focused on retrieving water vapor from AATS under cirrus and other thin clouds, and on getting J31 in situ meteorological measurements to compare to the Ron Brown sonde.

J31 and its instruments performed well, except for intermittent searching/tracking and detector temperature issues for AATS (see below).

Flight Path, Timing, and Measurements

Flight path is shown in Figure 1 below. Takeoff at 1913 UT. Contacted Ron Brown, requested sonde release, and swapped plans.

Climbed to ~6 km, getting successful water vapor retrieval through cirrus (see Figures 2-3 below).

Descended to near ship. They released sonde during first of several J31 passes near ship. J31 profiled up to ~7000 m and flew ~ 5-minute level leg there for SSFR. When approaching max altitude in climb, high clouds thickened and prevented AATS tracking. At ~6430 m and $T_{\text{stat}} = -10.2$, with AATS in sky-search mode, AATS locked up. After rebooting, AATS resumed searching and then tracking.

SSFR data are shown in Figure 4 below.

After SSFR leg at ~7000 m, J31 headed home. Touchdown at 2046 UT.

Debrief

If we want to go to Nova Scotia, we'll have to go straight there, not after working for ~1 hr over western Gulf. Air traffic control was tough above 17.5 kft. There we had to ascend in a spiral, rather than a ramp.

POS: Phil operated with instructions from Jim. Next flight should be OK using annotated written instructions.

Nav/Met: OK.

SSFR: Operated well. Lots of broken cirrus.

AATS: After AATS lost tracking because of thick high clouds, it entered sky-search mode. While searching, it jerked and stopped searching near max altitude. Regained searching/tracking after rebooting. 1.5-micron cold detector lost temperature control but regained it after the rebooting just mentioned.

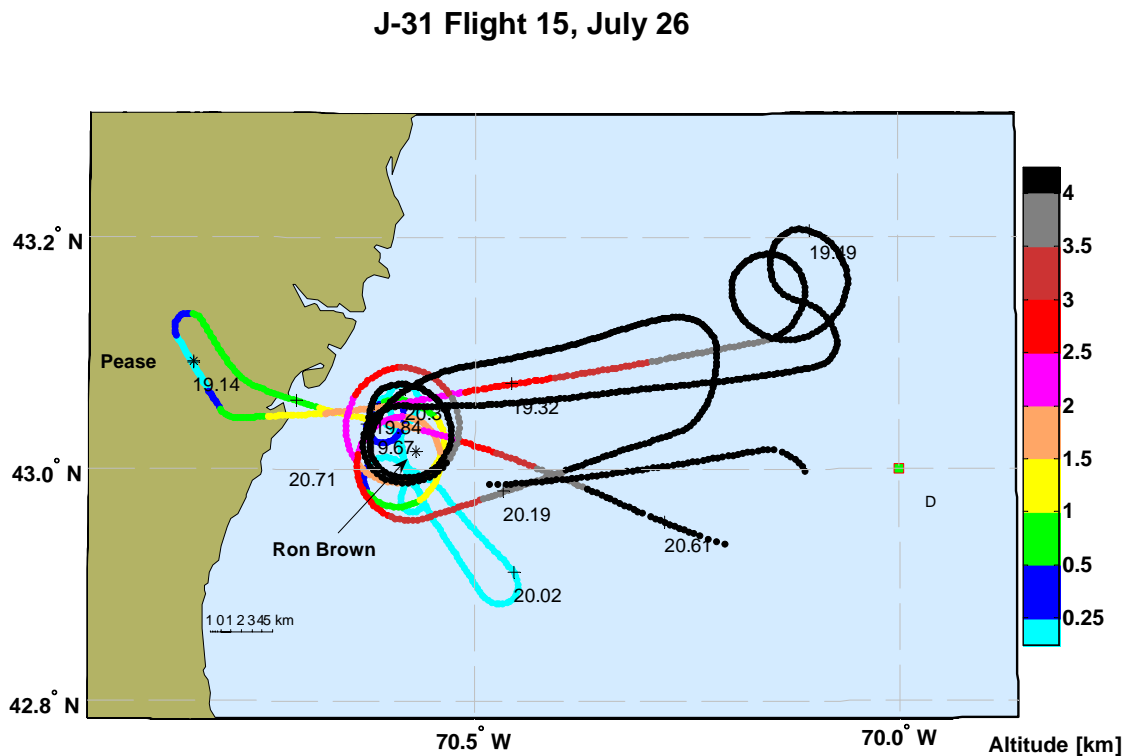


Figure 1. Flight track of J-31, Flight 15, July 26, 2004.

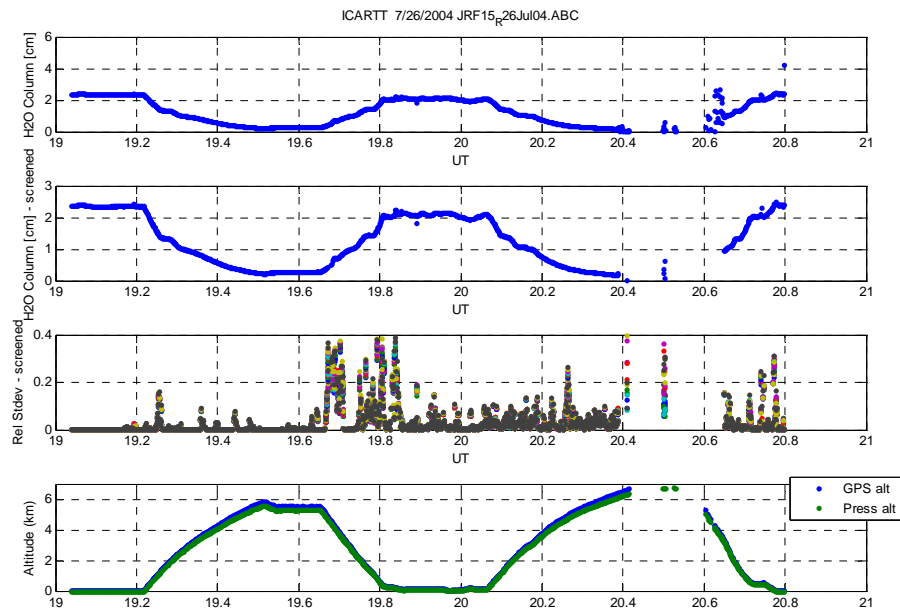


Figure 2. Time series of AATS-14 retrieved water vapor column (unscreened and screened), standard deviation of signals, and flight altitude for J-31 Flight 15, July 26, 2004.

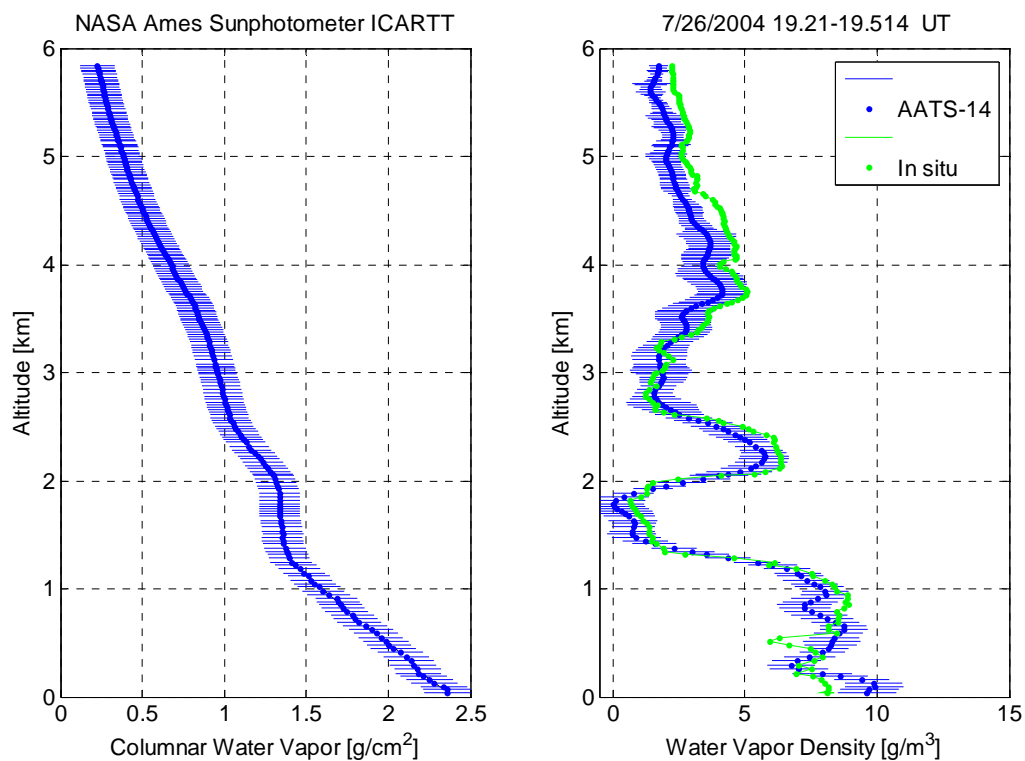


Figure 3. Left frame: AATS-retrieved column water vapor in profile on J31 Flight 15, 26 July 2004. Right frame: AATS water vapor density profile obtained by differentiating profile in left frame, compared to density from J31 in situ sensor.

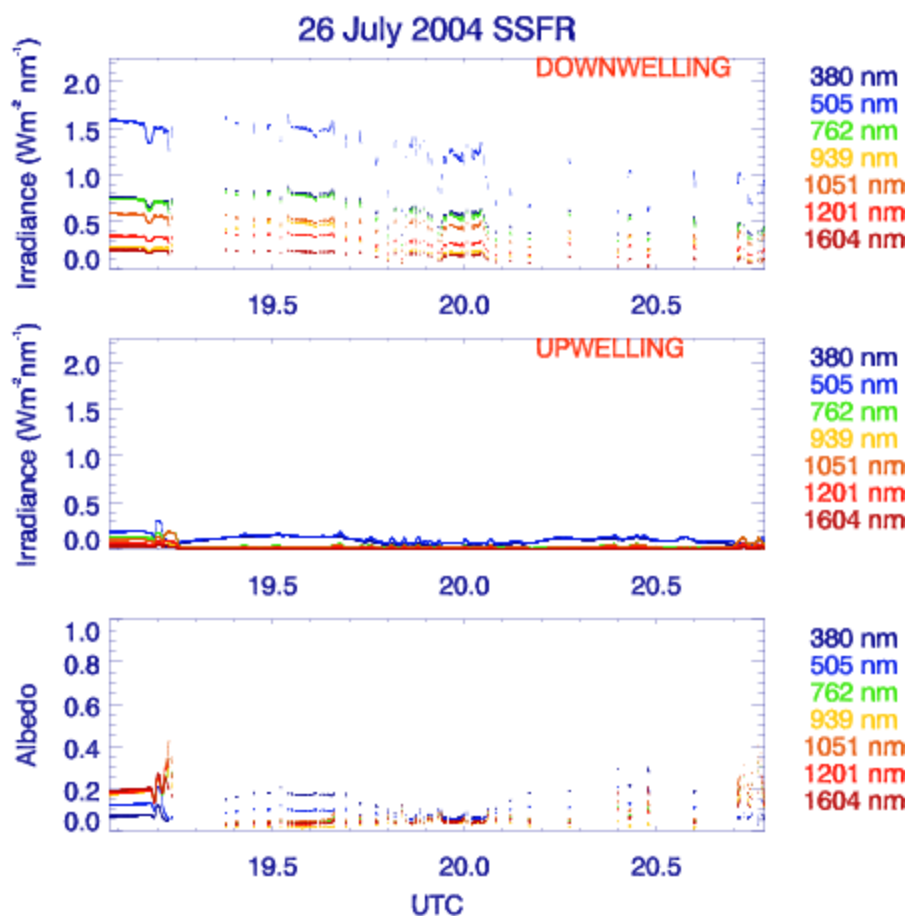


Figure 4. Time series of SSFR-measured downwelling and upwelling irradiance and albedo for J31 Flight 15, July 26, 2004. The downwelling (and albedo) has been filtered to remove data when the aircraft attitude deviated by more than 3% from level. The fact that J31 was in a spiral for much of the flight produces the speckled pattern in the downwelling and albedo time series.